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October 11, 1995

Secretary
Federal Communications Commission
Washington, D.C. 20554

Re: Follow-up *ex parte* communications, CC Docket 94-102,
E9-1-1 compatibility of PBX/MLTS and wireless call originations

Dear Mr. Secretary:

The attached documents are submitted as follow-up to a previously-reported meeting between representatives of the NENA, APCO and NASNA public safety communications organizations and staff of the Policy Division of the Wireless Telecommunications Bureau on July 26, 1995.

At that meeting, the staff asked about funding of upgrades to wireless, telephone company and PSAP communications networks and devices that would be required for improved E9-1-1 access by radio callers. Attached is an updated discussion, with charts and tables, compiled by Jim Beutelspacher, 9-1-1 Project Manager in the Minnesota Department of Administration. Also included are two articles from *NENA News*, reporting differing outcomes in legislative consideration of wireless E9-1-1 extension in the states of Washington and California.

The table captioned "National 9-1-1 Funding and Coverage" and dated October 6, 1995 is offered with the following supplemental explanation of certain abbreviations or other shorthand: "NTE" means "not to exceed." The rightmost column on "Telco Reimbursement" refers to varying methods of paying telephone companies for their costs of collecting fees or surcharges on behalf of states or localities. The "Notes" column reflects a variety of state and local funding refinements that are not amenable to general interpretation. Mr. Beutelspacher is available at (612) 296-7104 should Wireless Bureau staff wish additional information.

From the perspective of the Joint Commenters -- NENA, APCO and NASNA -- the materials demonstrate that local and state governments have found ways to finance wireline 9-1-1 and can be relied upon to do the same for upgrades required to achieve wireless compatibility.

Sincerely,

James R. Hobson
Counsel for NENA

cc: John Cimko, WTB/Policy; Bill Stanton, NENA; Bob Gurss, APCO Counsel

NATIONAL 9-1-1 STATUS

9-1-1 FUNDING NATIONALLY

There is no national funding of 9-1-1, although several states, including Minnesota, took advantage of federal matching funds to help pay for implementation of the service. The attached table shows whether legislation is in place in each state, whether it was mandated, the type of funding used, and whether a telephone company is authorized to retain part of fees collected to pay their cost of collection. Each state funds for 9-1-1 in their own unique manner, but some similarities can be seen in figure 1.
Eight states (16% of the states) fund 9-1-1 by paying for all or part of the service through a

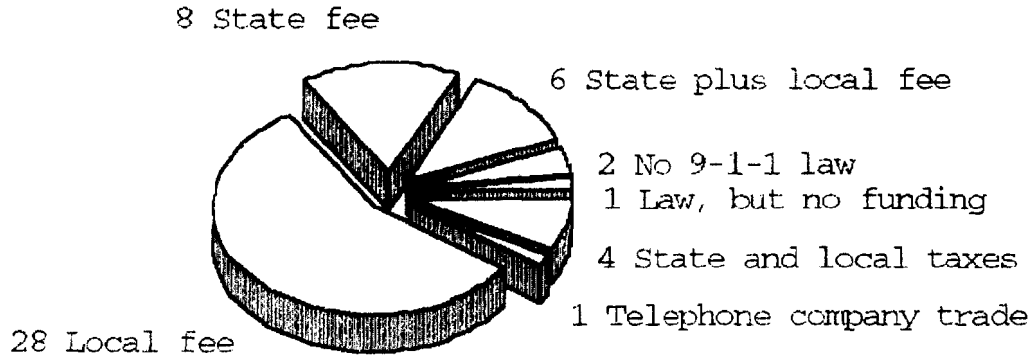


Figure 1 Most states fund 9-1-1 by allowing a locally collected telephone fee.

statewide 9-1-1 telephone surcharge. This serves to spread the cost of 9-1-1 across the entire state, making it affordable to even the smallest local unit of government. The statewide fees also serve to fund state level activities to help counties implement 9-1-1 and administer the program. The potential disadvantage to this method of funding 9-1-1 is that it may not provide funding for local government costs, possibly inhibiting 9-1-1 improvements in rural areas. Most other states fund 9-1-1 services from local telephone fees. Twenty-eight of the 50 states (56%) authorize local units of government to assess a fee on each telephone subscriber. This method of funding has advantages in large populated areas, where a locally collected monthly fee may allow funding of all direct costs, and, often, personnel, training, and other expenses as well. In less populated areas of each state, however, monthly fees are generally not sufficient to cover even basic 9-1-1 costs. Six states (12%) use a combination of state and local fees, allowing local funding as well as money to fund a statewide program and to help fund 9-1-1 for counties and cities which do not have a large enough population to cover the cost of 9-1-1 by themselves. Four states (8%) fund 9-1-1 through state or local

taxes, one state (2%) funds 9-1-1 through telephone company subsidization, and three states (6%) have no funding mechanism in place. Minnesota and Mississippi recently changed their 9-1-1 laws to specifically require cellular subscribers to pay 9-1-1 fees just like wire-line telephone subscribers. This innovation may help fund the development of needed improvements to cellular 9-1-1 systems.

NATIONAL 9-1-1 COVERAGE

Figure 2 is a map which indicates the estimated percentage of population coverage in the United States, and can be c ompared to an estimated national 9-1-1 coverage of 85%. Generally speaking, those states which mandated 9-1-1 coverage and/or provided for equitable funding of 9-1-1 implementation and improvements have achieved more coverage than other states. Eleven states enjoy statewide 9-1-1 service.

Several states, including California and Connecticut, have achieved statewide enhanced 9-1-1, and telephone company and government officials in California are working to redefine enhanced 9-1-1 to include better geo-location information (latitude, longitude, and elevation in addition to street address). These developments, can be viewed as necessary steps to help government deal with emerging technological changes and high customer expectations placed on 9-1-1 systems.

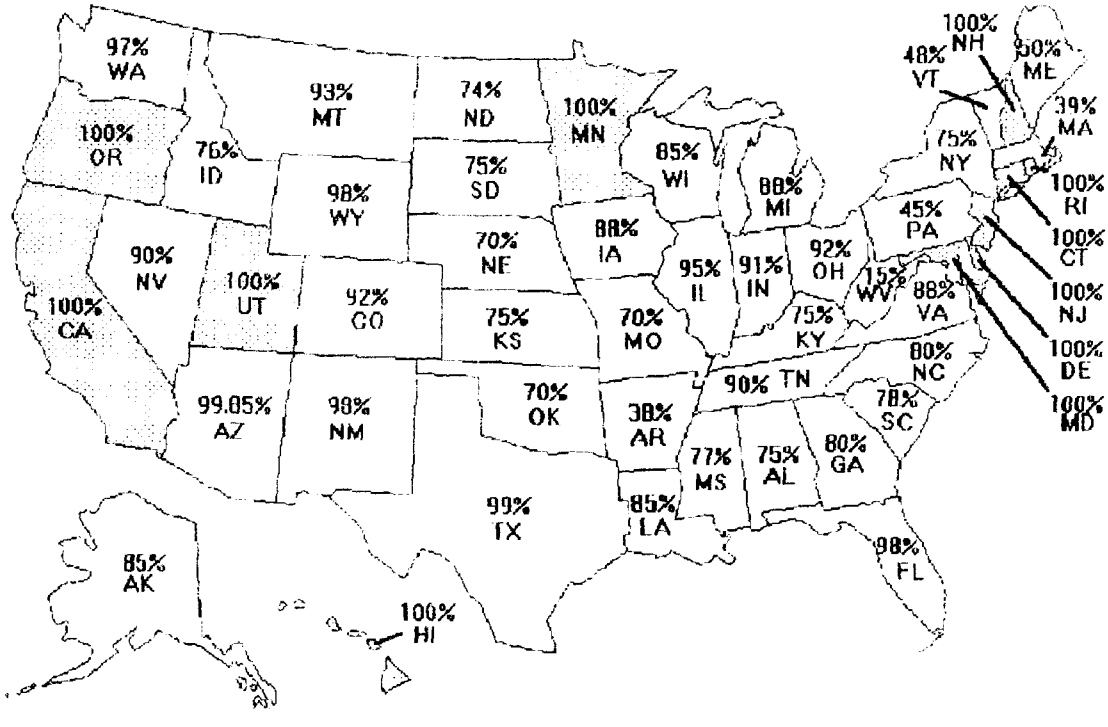


Figure 2 Eleven states have achieved statewide 9-1-1.

NATIONAL 9-1-1 FUNDING AND COVERAGE

October 6, 1995

STATE	COVERAGE	LEGISLATION	9-1-1 MANDATE	LOCAL FUNDING	STATE FUNDING	NOTES	TELCO REIMBURSEMENT
ALABAMA	75%	9-1-1		5%			1%
ALASKA	85%	ENHAN		$.50/.75			$150/1%
ARIZONA	.998	9-1-1			1.25%		
ARKANSAS	38%	9-1-1		5%			1%
CALIFORNIA	100%	ENHAN	12/85		.69% OF	INTRA-STATE	
COLORADO	92%	9-1-1		2%			2%
CONNECTICUT	100%	ENHAN	12/89		GEN FUND	& PRO RATA	
DELAWARE	100%	ENHAN	01/89			100% ENH	
FLORIDA	.981	9-1-1		$.50			1%
GEORGIA	80%	9-1-1		PRO RATA		$ FOR ENH	
HAWAII	100%	9-1-1			FEES		
IDAHO	76%	9-1-1		$1.00			3/4%
ILLINOIS	96%	9-1-1		FEE			3%
INDIANA	91%	METRO	ENHAN	3% / 10%		>/< 35,000	
IOWA	88%	ENHAN		$1.00		E911 PLANNG	1%
KANSAS	75%	9-1-1		2%			2%
KENTUCKY	75%	9-1-1		FEE			
LOUISIANA	85%	9-1-1		5%			1%
MAINE	50%	ENHAN	07/93		BONDING	$3.5M START	
MARYLAND	100%	ENHAN	07/95	$.50	$.10		1.5%
MASSACHUSETTS	39%		ENHAN			411 $ SWAP	
MICHIGAN	88%	9-1-1		4% / 16%		INSTL/RECUR	YES
MINNESOTA	100%	9-1-1	12/86	$.10	$.14	+WIRELESS	
MISSISSIPPI	77%	9-1-1	12/95	$1 TO $2		+WIRELESS	1%
MISSOURI	90%	9-1-1		$.75 OR		UP TO 15%	2%
MONTANA	93%	9-1-1			$.25	> 1%/COUNTY	YES
NEBRASKA	70%						
NEVADA	90%	METRO	METRO	PROP TAX			
NEW HAMPSHIRE	100%	ENHAN			$.39		
NEW JERSEY	100%	ENHAN	1/92		GEN FUND		
NEW MEXICO	98%	ENHAN		NTE $.25	$.25	+8M REFUND	$50/1%
NEW YORK	75%	ENHAN		NTE $.35			2%
NORTH CAROLINA	80%	ENHAN		FEE			
NORTH DAKOTA	74%	9-1-1		$1.00			5-CENT
OHIO	92%	9-1-1		PRO RATA	STARTUP*	*TAX CREDIT	
OKLAHOMA	70%	9-1-1		5%/3%		YR 1/AFTER	3%
OREGON	100%	ENHAN	01/91		5%	>.06%/CNTY	YES
PENNSYLVANIA	45%	9-1-1			$1-1.50		
RHODE ISLAND	100%	9-1-1			$.47		
SOUTH CAROLINA	78%	9-1-1		$.75-1.5		VARIES	2%
SOUTH DAKOTA	75%	9-1-1		$.75	$.01	$.50 (EAS)	1%/$100
TENNESSEE	92%	9-1-1		NTE 5%			3%
TEXAS	99%	ENHAN	9/95	$.50+	.029% LD	REGIONAL+	2%
UTAH	100%	9-1-1		NTE $.50			
VERMONT	48%	STUDY				FEASIBILITY	
VIRGINIA	88%	ENHAN		FEE			3%
WASHINGTON	97%	ENHAN	12/98	$.50	$.20	+WIRELESS	YES
WEST VIRGINIA	15%	ENHAN		$1.50		CHARLESTON	YES
WISCONSIN	85%	9-1-1		$.40		$.25 MILW	
WYOMING	98%	9-1-1		NTE $.50			1%

STATE-BY-STATE 9-1-1 LEGISLATION
INCLUDING KNOWN CITATIONS

October 6, 1995

UPDATES? --- CONTACT JIM BEUTELSPACHER (612-296-7104)

STATE	COUNTY/ CITY USER FEE	STATE FUNDING OR FEE	NOTES	TELCO COLLECT COSTS	CITATION	STATE CONTACT	NUMBER
ALABAMA	5%			1%	11-98-1	LEE HELMS	205-834-1375
ALASKA	$.50/.75			$150/1%	1993 SENATE BILL 97		
ARIZONA		1.25%			SS 41-702	OLGA SOTO	602-542-0911
ARKANSAS	5%			1%	12-10-301		
CALIFORNIA		.69% OF	INTRA-STATE		53100	LEAH SENITTE	916-657-9911
COLORADO	2%			2%	29-11-101 TO 103 AND PUC RULES		
CONNECTICUT		GEN FUND	& PRO RATA		PUBLIC ACT NUMBER 84-416	GEORGE POHORILAK	203-566-3243
DELAWARE			100% ENH		7401 A	HOWARD E VOGELIEN	302-739-9693
FLORIDA	$.50			1%	365.171 SS 13 & 14. SB-396 EXTENDED LAW	JIM MARTIN	904-487-2000
GEORGIA	PRO RATA		$ FOR ENH		46-5-120 - 132	SID FLYNT	404-656-2319
HAWAII		FEES			321-221		
IDAHO	$1.00			3/4%	31-4801 - 4811		
ILLINOIS	FEE			3%	CHAPTER 134.31 - 134.46	JOHN J.GREENAN II	217-782-4911
INDIANA	3% / 10%		>/< 35,000		36-8-16-1		
IOWA	$1.00		E911 PLANNG	1%	SEC 477B.1 - .7 & SEC 613A.4, 6/88	DAVE MILLER	515-281-7534
KANSAS	2%			2%	12-5301 - 12-5304		
KENTUCKY	FEE				KRS 65.760, 2/86		
LOUISIANA	5%			1%	R.S. 33:9101-9106, HB-785 9/9/88		
MAINE		BONDING	$3.5M START		CH 352, 2921 (STUDY 9-1-1)	PAUL PLAISTED	207-624-7062
MARYLAND	$.50	$.10		1.5%	ART 41. SEC 204H-1 - 204H-7	MARILYN FARNDON	410-764-4009
MASSACHUSETTS			411 $ SWAP		6A #18-18F, 159 #19-19A, 166, 114A & 15E	GLENN ROACH	617-272-1911
MICHIGAN	4% / 16%		INSTL/RECUR	YES	PUBLIC ACT 32, 3/16/86 - THRU MARCH '98	MARILYN MOORE	517-334-6380
MINNESOTA		$.14	RECURRING $		MS 403.1 THRU 403.13	JIM BEUTELSPACHER	612-296-7104
MISSISSIPPI	$1 TO $2		INCL MOBILE	1%	19-5-301 THROUGH 19-5-317		
MISSOURI	$.75 OR		UP TO 15%	2%	190.300-190.320 (1990)		
MONTANA		$.25	> 1%/COUNTY	YES	10-4-101-MCA	LARRY PETERSON	406-444-2586
NEVADA	PROP TAX				CH 244A, 268, 354.59805, 377.057		
NEW JERSEY		GEN FUND			52:176-36	BOB MILLER	609-882-2000
NEW MEXICO	NTE $.25	$.25	+8M REFUND	$50/1%	63-9D-6	BOB GUNTER	505-827-4950
NEW YORK	NTE $.35			2%	A, 6 S 300-308		
NORTH CAROLINA	FEE				62A-1		
NORTH DAKOTA	$.50			YES	57-40.6-01	LYLE GALLAGHER	701-224-2127
OHIO	PRO RATA	STARTUP*	*TAX CREDIT		4931.40 - .50 & .90, 5705.19, 5727.39		
OKLAHOMA	5%/3%		YR 1/AFTER	3%	SEC 2811 TO 19 OF TITLE 63, CH 58 S 2801		
OREGON		5%	>.06%/CNTY	YES	ORS 401.710 TO 401.790 THROUGH 1/1/2000	DAVID YANDELL	503-378-2911
PENNSYLVANIA		$1-1.50			CH 38 S. 7001		
RHODE ISLAND			NO $		X	ERNEST RICCI	401-274-0911
SOUTH CAROLINA	$.75-1.5		VARIES	2%	XX	TED LIGHTLE	803-734-3807
SOUTH DAKOTA	$.75	$.01	$.50 (EAS)	1%/$100	CHAPTER 34-45-1 TO 34-45-14	TOM KURTENBACH	605-773-3231
TENNESSEE	NTE 5%			3%	7-86-101, LOCAL 9 MEMBER BOARDS		
TEXAS	$.50+	.029% LD	REGIONAL+	2%	771.001	MARY BOYD	512-327-1911
UTAH	NTE $.50				69-2-1		
VIRGINIA	FEE			3%	58.1-3813		
WASHINGTON	$.50	YES		YES	HB 484, 4/24/81, ENHANCED, 1991	ROBERT OENNING	206-438-7737
WEST VIRGINIA	$1.50		CHARLESTON	YES	24-6-1 FEE CURRENTLY $1.50 PER LINE		
WISCONSIN	$.40		$.25 MILW		SS 146.70 (AFF BY 87 WISACT 27, 10/87)	JEFFREY RICHTER	608-267-9624
WYOMING	NTE $.50			1%	16-9-101		

Wireless

Cellular Taxation for 9-1-1 in Washington State, House Bill 2601

by Noel L. Mhyre

In the late summer of 1985, US West Cellular, New Vector Group, started cellular service in the Puget Sound area of Washington State. Following a brief period of arbitrarily routing calls from multiple counties into the Seattle Police Department's communication center, the call receiving-dispatching or transferring tasks were voluntarily assumed by the Washington State Patrol (WSP). The WSP correctly believed that the vast majority of the calls would involve incidents on the state highways and interstates that were their jurisdiction. As the years passed, however, that condition would radically change. A few months after cut-over of US West Cellular, McCaw Cellular One initiated their service. Cellular service was not and is not regulated in Washington State.

Within nine months, a check of cellular 9-1-1 calls coming into the Pierce County WSP PSAP showed that only a half dozen calls per month were being processed. Two years later (June 1988 through July 1989) WSP processed 29,000 cellular calls throughout the State. By mid-1992 the number of 9-1-1 cellular calls had grown to around 300,000 statewide annually. In the same time period, Pierce County calls increased from 4,000 to 33,000. Attempts by Pierce County to communicate with the two cellular companies concerning the increasing call load and the fact that cellular users were not taxed, as are the land line telephone users, were ignored. Indeed, existing statutory authority for allowing counties to impose an excise tax to fund 9-1-1 had been passed by the voters in 1982, several years before cellular technology was deployed. Thus, existing statute did not explicitly reference radio telephony, rather the statute was couched in terms of "switched access lines." The cellular companies maintained that since radio telephony did not utilize switched access lines from the end user, existing statute did not apply to their technology.

In 1992 the State Legislature directed the State Department of Revenue (DOR) to "study the cellular industry's current tax treatment in Washington State and other states, identify the tax policy issues and recommend changes resulting in a more appropriate tax policy for cellular communications." The DOR organized a broadly representative committee to study the range of state and local taxes and researched the various taxes that were applied to the industry throughout the United States. Due to its technical nature, a separate 9-1-1 subcommittee was appointed to study and make recommendations to the main body, concerning just the 9-1-1 issues. The subcommittee included county 9-1-1 management, representatives from the cellular industry (including the two named above and a representative of a smaller independent), representation from NENA and APCO, the State E9-1-1 office and land line providers. The subcommittee was chaired by a representative from the cellular industry and staffed by a facilitator from DOR.

Data were gathered, issues researched, studied, and discussed over the following twelve months. The 9-1-1 issues included land line subscribers subsidizing cellular subscribers, increasing financial impact on our communication centers by cellular call loads, lack of automatic number identification (ANI) and automatic location identification (ALI), personal communications systems (PCS) increasing the call loading, and projections of 30% to 75% of telephone subscribers moving from land line to radio telephony which would greatly erode the existing tax base which enables E9-1-1 to be provided.

Mid 1992 data showed 65% of statewide 9-1-1 cellular calls were unrelated to WSP jurisdiction and were routinely transferred to county or municipal PSAPs. One county's short term study (30 days) revealed 40% of the transferred calls involved domestics.

On the cellular industry side there was a belief that since the companies were not profitable and were still struggling to become so, an additional tax on their subscribers would be damaging to their subscriber base. Lacking knowledge of how the 9-1-1 tax money was allocated and controlled, there were suspicions of inappropriate use of these funds, that is, funding items that were totally unrelated to 9-1-1. Having no knowledge of the cost of operating PSAPs, they questioned why the existent land line taxes weren't sufficient to carry both the land line and cellular subscribers. Thus, many of the meetings between the two sides consisted of providing and discussing factual data for industry representatives as to the quantity and source of funds required to operate PSAPs and how these funds were allocated and controlled.

Members of the subcommittee were taken on tours by the respective cellular companies of their facilities and in turn the cellular representatives where taken on tours of several PSAPs. The year long study resulted in Chapter 6, "9-1-1 Tax: Findings and Recommendations" of the DOR "Report to the Legislature, Taxation of Cellular Communications in Washington State." The report was formally presented to the Washington Legislature in November of 1993.

During the latter months of 1993, representatives of industry and 9-1-1 jointly produced a piece of legislation which was introduced into the Senate and House of Representatives for deliberation during the 1993/1994 session.

Although ALI is not part of the legislation, it does appear in Chapter 6 of the report given to the legislature by the DOR. In discussing this issue with industry, it was pointed out that if providing ALI was technologically possible then it would not only greatly enhance their product for 9-1-1 purposes, but would also provide them new service products for marketing to their customers. A local electronics firm with considerable experience and background in this area was brought together with the cellular companies. Their engineering staff

was sufficiently convincing that they could indeed provide a technology for the companies that would allow them to determine the location of a particular customer when they called 9-1-1.

The technical work is currently progressing between the electronics firm and McCaw Cellular with oversight by the State E9-1-1 office. Currently there are some 29 companies, domestic and foreign, who are working on this issue by utilizing radio directional finding technology as opposed to GPS. We are very hopeful that someone will market a reliable and accurate locating technology in the next several years.

Representatives from the two major cellular companies, DOR, and 9-1-1 testified jointly in favor of the legislation before the various Senate and House Committees. Highlights of the Senate and companion House Bill are as follows:

1. Each end user of cellular (or wireless) telephony may be taxed 25 cents per month based on their telephone number.

   Land lines are currently taxed at a rate of 70 cents per line. Revenue is split 50 cents for the county and 20 cents for the statewide E9-1-1 program. However, approximately half of the enhanced county's revenue goes back to the vendors for providing enhanced services. Since none of the 25 cents goes back to the cellular companies, the net is about the same.

2. No later than January 1, 1995, the cellular (or wireless) companies will provide an ANI data stream in a format suitable for PSAP usage.

3. The legislation mandates that DOR perform a study of how 9-1-1 is funded across the State. The study will include the question of erosion of existing funding due to changing technologies and the increasing usage of radio telephony. The DOR final report of the findings is due no later than July 1, 1995.

4. The Bill authorizes each County to impose this tax by locally legislated ordinance. Thus, it is a local option tax rather than a state tax. Collections from the end user customer will be accomplished by the cellular industries' billing process and remitted to the Counties.

House Bill 2601, having passed both Senate and House, was signed into law by the Governor of Washington State March 23, 1994.

Noel L. Mhyre is 9-1-1 manager for Pierce County, Washington.

Alternate Routing Problem Solved by Cellular Telephones

by Ross Powell

The Yolo County Communications Emergency Service Agency is a Joint Powers Agency serving three cities and the County of Yolo with consolidated dispatch of law, fire and medical responders. In addition, the Agency has the largest Public Safety Answering Point (PSAP) in Yolo County (Northern California) serving approximately 110,000 9-1-1 customers. Smaller PSAPs serve the City of Davis and the campus of the University of California, Davis.

The Problem

In exploring the issues of diversified/alternate routing of 9-1-1 calls for the Agency, no reasonable solutions were found. The two smaller PSAPs often found themselves with one dispatcher on duty. Accordingly, rerouting 9-1-1 calls from the larger PSAP which utilizes a minimum of four dispatchers would paralyze the smaller PSAPs by the volume of calls and would not be useful. The transfer of calls to another larger PSAP located in the neighboring City of Sacramento appeared possible at first blush; however, even if the physical routing problems were solved, each PSAP found themselves utilizing completely different radio spectrums for dispatch of responders.

The Solution

Consultation with Cellular One representatives revealed that cellular telephone equipment manufactured by Telular, Inc., could provide a low cost solution. Four cellular telephones mounted in a "black box" (designated as CPTE-4) were installed next to the Pacific Bell 9-1-1 equipment. These emergency telephones provide an emergency path for 9-1-1 calls if the seven 9-1-1 trunks coming to the PSAP from Sacramento are cut or disabled. They are installed in a manner which allows them to appear on the dispatch telephone console as just another 9-1-1 button, only labeled A9-1-1 to show the call is on the alternate (cellular) link. Switching to the cellula link can be done by Pacific Bell personne when they recognize a trunk problem ex ists, or dispatch personnel at YCCESA ca activate a control which causes the Pacifi Bell switch to automatically forward call to the cellular lines. The latter procedur can be utilized if on-premise problems exis which are temporarily unknown to Pacifi Bell technicians. Operationally, 9-1-1 call are all forwarded by Pacific Bell to a singl (or primary) cellular number which, in turn hunts to one of the three remaining num bers when the primary is busy. This huntin is accomplished within the Cellular On switch.

One more problem, one more solution

A remaining problem existed. How would 9-1-1 calls be answered if the dis patch center needed to be evacuated? As solution, a regular telephone handse plugged into an RJ11 jack added to th dispatch console provides the capability t "call forward" the primary cellular num ber to two other cellular telephones in stalled in the mobile communications van The "auto dial" feature of this electroni handset allows a single button selection t either initiate or cancel this function. Again the call forwarding feature is accomplishe in the Cellular One switch and provides th capability to answer 9-1-1 calls and dis patch emergency responders from the mo bile communications van at any location within the County. The Telular system ha been used successfully in several areas fo emergency communications. This installa tion, cooperatively performed by Cellula One, Inter-Tel, and Pacific Bell personnel is the first such installation in the Unite States to utilize cellular telephones a backup for 9-1-1 calls. Additional infor mation can be obtained by calling Ros Powell, Director, YCCESA, at 916-666 8900.

In Support of a National Standard: The 9-1-1 Technology Dilemma

"... people are arming themselves with their own weapons to fight crime and insure their personal safety."

by W. Clay Paxton

Crime and public safety are the biggest national concerns in America. The communist threat, illegal immigration, education and even our national economy have taken a back seat to individual fears about personal safety and the perceived growth of crime in our communities.

Pressed by this concern, national and state legislators are moving with a high level of public debate and visibility in enacting public policy measures such as "Three Strikes," new prison construction, and the National Crime Bill. The number of local measures to enhance law enforcement and public safety are at an all time high. And, as we are all aware, the level of press coverage and media coverage are consistent with heightened concerns about public safety.

Individually, people are arming themselves with their own weapons to fight crime and insure their personal safety: alarm systems, subscription to security services, community alert programs, gun purchases, and in ever growing numbers, cellular telephones.

The Wireless Influence

Cellular telephones represent the first significant adaptation of wireless telecommunications technology to personal safety. Recent industry studies reflect phenomenal growth in cellular sales with usage nearly doubling about every 18 months and 2 of every 3 new telephone numbers being assigned to cellular phones. There are currently more than 21 million cellular phones in service, up from 11 million at the start of 1993. The Yankee Group, as quoted in *USA Today*, claim that their studies indicate 46% of new users cite personal security and safety as the number one reason for the new purchase.

Nationwide in 1993, there were about 6.5 million calls to 9-1-1 using cellular phones, about 150,000 per month in California alone. Because cellular 9-1-1 calls do not provide telephone number and location data as wireline calls do, they are typically routed to a default agency such as the highway patrol or state police, based on local operating agreements. The rapidly increasing cellular call volumes are having a crippling affect on these default agencies and traditional technology and personnel augmentation are offering little relief.

Additionally, in many emergencies, the default agencies are not the appropriate initial response agencies for medical emergencies or criminal activity and must relay the request to the appropriate response provider. PCS and other wireless technologies are expected to exacerbate this critical situation.

9-1-1 is a Telephone Company System

Our superb 9-1-1 systems are taken for granted by many, including ourselves. The expectation is that new technologies and telecommunications carriers are simply incorporated into the existing 9-1-1 system. What is often little understood is that 9-1-1 is a basic exchange service of the local telephone company, e.g. a "dial tone" service such as 'O' Operator, directory as: tance and 6-1-1 repair. Therefore, the c tone provider also provides the 9-1-1 s vice.

Cellular carriers typically use a call p cessing convention similar to a speed-c feature. That is, when 9-1-1 is dialed, cellular switch receives the numbers, c verts them to a standard 7-digit telephc number and sends the call over the pub switched network to a default PSAP.

California law requires that all 9-1 systems in the state provide the featu functionality of Enhanced 9-1-1. Sir cellular does not have a 9-1-1 system, p se, they are exempted from this requi ment. Likewise, others who might provi dial tone such as cable operators and alt nate service providers are also exempt.

The Federal Response

On September 19, 1994, the FCC ini ated a Notice of Proposed Rulemaki (NPRM) to ensure that wireless telepho users have access to 9-1-1 emergency s vices comparable to those currently ava able to users of the wireline telephone n work. In a unanimous vote of the Commi sion, Chairman Hundt said, "There will a lot of ways telephone calls are made in t future and everyone involved should mandated to meet certain public health a safety considerations. [This NPRM acti is a] perfect example of the role gover ment should have in encouraging compe tion while setting rules to protect the pu lic."

The California Approach

In the 1994 California legislative se sion, Assembly Bill 2455 (AB2455) w introduced by Assemblyman Bob Eppl E9-1-1 is distinguished from other 9-1 systems in that it provides Selective Rou ing (SR) so that the call is electronical routed to the appropriate public safe agency based on the location of the calle Automatic Number Identification (ANI) s that the caller's telephone number is di

played at the public safety agency, and Automatic Location Information (ALI) so that the address of the caller is also displayed at the public safety agency. AB2455 sought to alter the definition of E9-1-1 to read, Selective Routing, ANI and Graphic ALI.

With that change in definition, public policy would have required enhancement of the California 9-1-1 infrastructure which is fully supported by the collection of a special surcharge on telecommunications. The tabular data bases in the local exchange companies would have been converted to graphic files based on GPS (Global Positioning System) standards. In this context, addresses would be assigned a Universal Address based on the GPS location convention (24 character latitude, longitude, and elevation). This address or location would then be displayed on a mapped image as an icon at the X-Y coordinates. [Importantly, the Universal Address is based on the GPS data convention for addressing and not the specific GPS technology for transmitting location data.]

The display of graphic data would require a change in the display screens at the Public Safety Answering Point (PSAP) as today's LED and ELD screens are not appropriate for full graphic displays of mapped images. The solution is an intelligent workstation consisting of networked 486 PCs with a Windows or NT type operating system on which various workstation screens at the PSAP could be consolidated as well as accommodate the mapped ALI. In this scenario, the mapped images are resident on the PSAP system with periodic image updates from a master network file and thus do not require massive bandwidth in the transport medium.

This was the simple strategy of AB2455, to create a standard applicable to all forms of 9-1-1: optimize resources; modernize PSAP telecommunication and data display equipment; and, minimize the proliferation of multiple PSAP terminals.

A Standard We Can Live With

With an enriched infrastructure such as this, wireless location data could be displayed on PSAP workstations just as is existing wireline ALI. Additional subscriber information or data could also be provided in a display window meeting the individual carrier's specifications or other industry standard.

Considering one of every five Americans live in California, such a significant retrofit of the California 9-1-1 system would have had a tremendous leadership impact to the entire 9-1-1 industry. It would have put in place the infrastructure to allow all the various wireless carriers to provide location information using any technology appropriate to their business objectives. Equally important, the PSAP would receive 9-1-1 data in a common manner and be able to formulate an emergency response to calls in a standard fashion.

This Was Not To Be

The failure of our initial attempt in California was due to a number of failures and inadequacies. The bill failed due to lack of industry support in an era of scarce financial resources. Even though our 9-1-1 fund yields a surplus to the State General Fund annually, there was not enough public safety support for the bill to survive. As was expected, the politics within the State Legislature were gruesome. Not expected was the seeming lack of concern and industry support from our profession.

There are at least three reasons why this could have occurred: it was bad public

Technological Innovation for E 9-1-1 Services (continued from page 9)

orders to the live E9-1-1 network within three hours of receipt of the information. Additional metrics include ALI response time (2 seconds or less; our average is .79 seconds), customer (PSAP) affecting down time, customer satisfaction on MSAG and general data base maintenance. Secondary metrics include such items as ALI No Record Found research and resolution, default routing research, etc.

These performance metrics are communicated on a daily basis to customers using a highly secure Lotus Notes® based data distribution system. This allows clients to observe the daily results of the NDSC operation for their customers or the public. Both the NDSC and NDSC customers have a commitment to continual process improvement, monitoring all operational metrics and working to improve E9-1-1 infrastructure operations. A full time metrics officer is responsible for calculating and reporting all NDSC metrics and their trends.

Aggressive Database Reconciliation (RECON)

The NDSC operates an aggressive program of data RECON or reconciliation to check E9-1-1 telephone and routing information against other data sources to find errors in the source data bases. These processes are highly automated systems which search for anomalies in the data by comparing E9-1-1 information automatically to other telephone service company and jurisdiction provided information. The suspect information is then managed through a RECON research queue process.

Survivability

Based on Tandem Computers' fault tolerant systems, deployed in a "fail safe" geographically distributed configuration, the NDSC network and distributed systems are designed to continue to support E9-1-1 operations even though single processing sites may be totally destroyed or incapacitated. Network operations are provided via dedicated high speed links using different long haul carriers, switched high speed back-up links, and finally using VSAT satellite technology to avoid terrestrial connections in the event of massive failure of the national long haul network systems. In the event of complete failure of all data support systems and all levels of backup, the voice network is designed to continue to deliver E9-1-1 calls.

Security

NDSC data system security meets the demanding standards of both the regulatory and operational arenas worlds of E9-1-1. Comprehensive security systems and practices are in place to protect the integrity of the systems and the confidentiality of the information.

Economic Business Model

A natural result of the network-based services offering is that public safety agencies and telephone service providers using the system do not have to purchase up front licenses or invest in large hardware systems. Transactions are priced on a pennies per line per month basis. Using this model, transition from old or inadequate systems can be achieved without large capital investment.

For More Information

For additional information on SCC or the National Data Services Center, please contact SCC Communications at (303) 581-5600. Tours of the NDSC may be scheduled by contacting Mr. Mark Kulaga, Manager of Marketing Communications, at (303) 581-5600. Tours require advance scheduling and completion of a security form and associated clearance waiver.

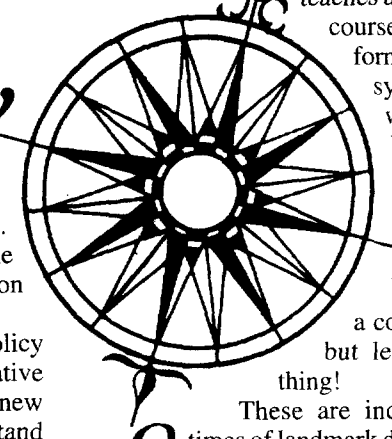
policy; people thought it was such a good idea that it could succeed without their involvement; or, the issues and consequences simply weren't understood. Facts are, an industry standard is good public policy; it won't happen without industry activism; and the issues don't seem to be well understood throughout the industry.

Charting a Course

The disappointments of this effort can not be allowed to kill the dream. Though it was obscure during the process, in retrospect, one of the biggest failures was a lack of effective communication. We must keep talking and exploring the issues even to the point of exhaustion because many still "don't get it."

It is expected that a new public policy effort will come forth in the next legislative session in California. Hopefully, that new effort will succeed because we will stand together based on a common understanding of the issues and concerns and less on politics.

Keep up the noise level, keep asking the hard questions, and look at every new product as possessing a possible key to the solution. We desperately need a national standard for 9-1-1 or we will have to live with the patchwork and haywire given to us by fate. History teaches us that is a poor course. If the California strategy and system design is wrong, let's build a new one based on a common vision but let's do something!



These are indeed exciting times of landmark decisions. The good news is that we all get to participate at a time when legacies will be made.

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Power Trivia

Q. Who's the most powerful lobbyist for the Public Safety industry?

A. You are. As a voter and constituent, you have the most powerful tools—your hands, a pen and stamp, telephone, and fax machine—to make your voice heard to government. So, when NENA asks you to contact lawmakers or regulators, remember you're part of the solution.